

All COs of Mechanical Engineering

2017-18 SEM I		
	Course Name	Course Code
1	Refrigeration and Air Conditioning	68894
	CO's	
1	Demonstrate and understand the need and importance of HVAC technology, the typical and some advanced and innovative schematic designs, and the goals of HVAC engg. & HVAC systems	
2	Demonstrate and understand the thermal comfort conditions w.r.to temp., humidity, human clothing & activities and its impact on human comfort, productivity & health	
3	Demonstrate and understand the psychrometry and its application in HVAC engg. and design and will practice or observe psychrometric measurements	
4	Demonstrate and understand the heat transfer in buildings with a given architectural design and its application to heating and cooling load estimation especially including thermal lag	
5	effects by conducting a detailed annual load analysis for a representative building and presents the results of this analysis in a formal report possibly including recommendations for energy conservation.	
6	Demonstrate and the understand the engg. & operation of vapor compression and possibly heat driven refrigeration systems and evaporative cooling systems and systems	
7	understand contemporary issues of ODP& GWP w.r.to refrigeration	
2	Mechanical System Design	68895
	CO's	
1	Identify the importance of the Aesthetic and ergonomic, Pressure vessel, optimum design and Multispeed Gearbox. Recall the type of gears	
2	Discuss the various Aesthetic and ergonomic parameters, and design considerations in various manufacturing processes	
3	Illustrate the Brake, clutch, Gearbox problems and analyze the solutions.	
4	Convert a product in to the optimum product	
5	Design mechanical systems like pressure vessels, machine tool gear boxes and various IC engine components	

3	Finite Element Analysis	67503
	CO's	
1	Understand the fundamental concepts and theory of FEA	
2	Discuss and Explain 1D problems using FEA theory	
3	Solve 2D plane stress and plane strain problems using FE approximations	
4	Analyze the truss for given loading condition	
5	Determine various nodal temperature values in thermal domain , 6) Compile and explain various steps in FEA	
4	Automobile Engineering (Elective I)	67506
	CO's	
1	student will be able to explain components of automobile.	
2	students will be able to distiquish various types of automobile layouts as per drive given to wheels.	
3	students will be able to identify types of auto bodies & material.	
4	students will be able to explain modern trends, techniques used in industry.	
5	Total Quality Management (Elective II)	67833
	CO's	
1	Understand importance of assuring quality in the service or manufacturing sector and explain Quality assurance system	
2	Identify and solve the quality related problems in manufacturing or service sector at various stages by using various TQM tools and techniques,	
3	Calculate reliability of system	
6	Industrial Product Design (Elective II)	68916
	CO's	
1	Identify the challenges ,Customer needs,concepts of product Design & development	
2	Discuss product development Process & Planning ,Setting Specification	
7	Industrial Training @	68910
	CO's	

1	Comprehend the knowledge gained in the course work	
2	Create, select, learn and apply appropriate techniques, resources, and modern engineering tools.	
3	Discuss the Product architecture, Implication, PDM	
4	Understanding of DFMA, Tolerance, DOE & Value Engineering.	
5	Discuss Aesthetics, Ergonomics & control & Displays	
6	Understanding of Industrial Design, Health and safety consideration in chemical industry.	
8	Project Phase -I	68912
	CO's	
1	Improve the professional competency and research aptitude in relevant area.	
2	Develop the work practice in students to apply theoretical and practical tools/techniques to solve real life problems related to industry and current research.	

	2017-18 SEM II	
Course Name	Course Code	
1	Mechatronics	69082
	CO's	
1	Understand the introduction of Mechatronics; study the types of sensors and transducers and their applications.	
2	Understand the need of signal conditioning, study the various parts used for signal conditioning, modes of data transfer and signal conditioning terms like buffers, handshaking, polling and interrupts	
3	Understand the logic functions and their application, study of comparison between microprocessor and microcontroller and their architecture.	
4	Understand the working of plc and components used; study the fundamentals of ladder programming and symbols used.	
5	Building a ladder programs for problems related to industrial applications.	
6	Case studies of Mechatronics system designs, like piece counting system , pick and place manipulator and part loading and unloading etc.	
2	Energy and Power Engineering	69083
	CO's	
1	Demonstrate need of different energy sources and their importance	

2	Analyze the utilization of solar, wind energy etc.	
3	Comprehend various equipments/systems utilized in power plants	
4	Illustrate power plant economics	
3	Noise and Vibration	69084
	CO's	
1	Develop mathematical model to represent dynamic system	
2	Estimate natural frequency of mechanical element/system	
3	Analyze vibratory response of mechanical element/system	
4	Carryout measurement of various vibration parameters	
5	Understand relevance of noise in mechanical systems	
4	Industrial Engineering (Elective III)	69085
	CO's	
1	Analyze and design new method of performing job.	
2	Measure and estimate standard time for job.	
3	Understand different types of plant layouts.	
4	Interpret job evaluation and merit rating.	
5	Industrial Automation and Robotics (Elective IV)	69096
	CO's	
1	1. To Describe potential areas for automation and justify need for automation	
2	2. To explain the basic principles of Robotic technology, configurations, control and programming of Robots	
3	3. To select suitable major control components required to automate a process or an activity And the various drive systems for robot, sensors and their applications in robots and programming of robots.	
6	Project Phase -II	69099
	CO's	
1	Improve the professional competency and research aptitude in relevant area.	
2	Develop the work practice in students to apply theoretical and practical tools/techniques to solve real life problems related to industry and current research.	
TE Mechanical		
TE- SEM I		

	Course Name		Course Code
1	Control Engineering		
	1. Study the control system, its type and applications.		
	2. Prepare mathematical model of physical simple systems.		
	3. Study concept of system stability and system response.		
	4. Study various control actions.		
	5. Learn to use MATLAB software to analyze control system.		
2	Heat and Mass Transfer		66243
	1. Students will learn about what is heat transfer, what governs the rate of heat transfer and importance of heat transfer.		
	2. They will also learn the three major modes of heat transfer viz., conduction, convection, and radiation. In addition to these three main modes of heat transfer, students will also learn the phenomena of heat transfer during phase change (boiling and condensation heat transfer).		
3	Machine Design I		66244
	1) Study basic principles of machine design.		
	2) Understand the principles involved in evaluating the dimensions of a component to satisfy functional and strength requirements.		
	3) Learn use of catalogues and design data book.		
4	Manufacturing Engineering @		
	1. Study of metal cutting technology including the process, measurements, design		

	and		
	2.Selection of various cutting tools and their industrial specifications.		
	3.Introduce the students to design practices of toolings (Jigs and Fixtures) and die design for presswork.		
	4.Introduce the students to design practices of Single spindle automat.		
	5.Study of various aspects of CNC machine technology and its tooling.		
5	Theory of Machine - II		66242
	1. Indentify the various types of gears.		
	2. Select a gear drive for practical purpose.		
	3. Analyze the gyroscopic effects for practical life.		
	4. Solve a balancing problem.		
	5. Do the balancing of practical devices to reduce vibration.		
	6. Do force analysis of mechanisms		
	CAD/CAM Laboratory		
	a) Parametric Modeling Fundamentals and Procedure		
	b) Computer Aided Manufacturing Fundamentals and Procedure		
	a) Create constrained 2-D Sketches b) Prepare part programs		
	c) Create Solid Models of machine components with drafting		
	d) Create assembly model (minimum 5 components)with drafting		
	Professional Skill Development		

	1. Communicate effectively in business situations		
	2. Practice and improve technical skills		
	3. Utilize collaborative and management skills in a team context		
	4. Develop presentation skills.		
	Workshop Practice V		
	1. Understand and perform the various machining operations.		
	2. Implement principles of metrology.		
	3. Design the sequence of various processes required to manufacture the components.		
	Mini-project-I		
	1.Work in a group on specific assignment.		
	2.Think creatively to come out with feasible solution for engineering real life problem.		
2017-18 SEM II			
	Course Name		Course Code
1	Industrial Management and Operation Research		
	CO's		

	1. State the various functions of management.
	2. Know various functional areas of management.

2	Industrial Fluid Power	
	CO's	
	1) Classify and understand various hydraulic and pneumatic ISO/JIC symbols.	
	2) Discuss hydraulic and pneumatic system components.	
	3) Illustrate hydraulic and pneumatic circuits with its application.	
	4) Discuss maintenance and safety regulation in hydraulics and pneumatics.	
	5) Describe fluidics and its application.	
3	Metrology and Quality Control	66839
	CO's	
	1) Understand the use of standards in measurement, limits, fits and tolerances.	
	2) Understand the principle/s, construction, working and use of comparators and angle measuring instruments.	
	3) Study the measurement of geometrical forms and surface roughness	
	4) Study the methods used for the measurement of screw threads and gears	
	5) Understand the concept of quality and various SQC techniques.	
4	Machine Design II	66840
	CO's	
1	Explain general design procedure of designing a machine element, factor of safety- its selection & selection of various engineering materials, selection of various engineering material	
2	Design machine elements knuckle joint, Turn buckle, Levers, welded & bolted joints	
3	Design solid & hollow shafts, transmission & line shafts, splined shafts, Keys and Couplings	

4	Explain various types of springs and their applications, and design helical, compression springs subjected to static loading	
5	Design power screw & nuts	
6	To do selection of flat belt, V belt as per manufacturer's catalogue.	
5	Internal Combustion Engines	66841
	CO's	
	1. Study constructional details and various types of internal combustion engine.	
	2. Understand and analyze thermodynamic cycles of IC engines.	
	3. Understand combustion phenomenon in SI engine and CI engines.	
	4. Impart knowledge about various systems on the IC engines	
	5. Impart knowledge about various engine performance characteristics and its testing	
	Computer Integrated Manufacturing Lab	
	CO's	
	1. Study role of CAD/CAM in CIM and CIM implementation issues.	
	2. Use DBMS in factory data collection system	
	3. Study concepts of Computer Aided Production Planning and Control	
	4. Apply various classification and coding system in group technology.	
	Seminar	
	CO's	
	1. Create awareness about latest technological aspects	
	2. Improve presentation and communication skills	
	3. Improve skills related to search on the internet	
	4. Motivate for research in respective area	
	5. Provide platform for interaction amongst students on advanced and/or emerging topics of	

	technology.
	Workshop Practice - VI
	CO's
	1. Understand and perform the various machining operations.
	2. Implement principles of metrology.
	3. Design the sequence of various processes required to manufacture the components.
	Mini-project- II
	CO's
1	Work in a group on specific assignment.
2	Think creatively to come out with feasible solution for engineering real life problem.

SE SEM-I			
	Course Name		Course Code
1	Engineering Mathematics - III		
	1.Understand basic concepts of Linear Differential Equations		
	2. Solve Linear Differential Equations with constant coefficients for solving problems in Mechanical engineering fields.		
	3 .Understand Divergence of vector point function and Solenoidal vector fields and Curl of a vector point function and Irrotational.		
	4 .Apply Laplace Transform for solving problems in different engineering fields.		
	5 .Solve Partial Differential Equations related to Mechanical Engineering application.		
2	*Electrical Technology		
	1 Select the electrical drives for different mechanical processes		
	2 Understand concepts of electrical heating and welding		
3	Applied Thermodynamics	63352	

	1 Understand basic concepts of physics and chemistry behind thermodynamics		
	2 Solve introductory problems on Rankine cycle.		
	3 Understand functioning of steam generators and condensers		
	4 Design the steam nozzle.		
	5 Understand basic concepts of Impulse turbine		
4	Metallurgy		63353
	1 Understand basic concept of metal structure		
	2 Understand fundamental knowledge of Ferrous and Non Ferrous Metal		
	3 Selection of Metals and Alloys for different application		
	4 Understand need of Heat treatment and various heat treatment processes.		
5	Fluid Mechanics		63354
1	Define and calculate various properties of fluid.		
2	Explain various types of flow and Calculate Velocity and acceleration of fluid particles.		
3	. Apply Bernoulli's equation to simple problems in fluid mechanics.		
4	Explain laminar and turbulent flows on flat plates and through pipes		
5	Understand boundary layer. Explain and use dimensional analysis to simple problems in fluid mechanics		
6	Understand drag and lift. Apply fundamentals of compressible fluid flows to relevant systems		
6	Machine Drawing		
	1 Use BIS conventions in machine drawings		

	2 Find line/curve of intersection between two solids		
	3 Sketch the various machine components		
	4 Read and interpret the given production drawings		
	5 Understand significance of assembly and detail drawings		
7	Computer Graphics		
	1 Understand basic concepts of computer graphics.		
	2 Understand graphic devices		
	3 Understand importance of Curves and Surfaces.		
	4 Do three dimensional transformations		
8	Computer Programming using C++		
	CO's		
	1 Develop algorithms for solving problems using object oriented language.		
	2 Apply their knowledge and programming skills to solve various computing problems in the field of Mechanical Engineering.		
9	Workshop Practice - III		
	1 Understand types of patterns and Core boxes,Materials used, Pattern Allowances		
	2 Understand Permeability Test, Green Compressive strength, Preparation of green sand mold.		
SE-SEM II			
	Course Name		Course Code
1	Applied Numerical Methods		

	1 Identify, classify and choose the most appropriate numerical method for solving a problem.	
	2 Solve the Mechanical Engineering problems using softwares	
2	Analysis of Mechanical Elements	
	1 Demonstrate fundamental knowledge about various types of loading and stresses induced.	
	2 Draw SFD and BMD for different types of loads and support conditions	
	3 Compute and analyze stresses induced in mechanical components	
	4 Analyze buckling and bending phenomenon in columns and beams.	
3	Fluid and Turbo Machinery	63362
	1 Understand definition & principle of turbine, pumps & compressor	
	2 Clarity, compare & Explain types of turbine, pumps & compressor	
	3 Derive & solve to demonstrate performance of turbine, pumps & compressor	
	4 Calculate efficiencies & compare the performance	
4	Theory of Machines - I	
	1 Understand different types of mechanisms and their applications	
	2 Analyze kinematic theories of mechanism,	
	3 Design cam with follower for different applications	
	4 Select different power transmitting elements according to application	
	5 Select different governing mechanisms according to application.	
5	Machine Tools and Processes	
	1 Understand Importance of casting as manufacturing Process.	
	2 Understand different types of forming and Plastic Shaping processes.	
	3 Understand Basic working principle, Configuration, Specification and classification of machine tools.	

	4 Understand Working Principle and Applications of nontraditional machining.	
6	Testing and Measurement	63365
	1 Understand working principle & applications of speed measuring instruments	
	2 Understand working principle & applications of temperature measuring instruments	
	3 Understand working principle & applications of pressure measuring instruments	
	4 Understand working principle & applications of flow rate measuring instruments	
	5 Understand working principle & applications of vibration measuring instruments	
7	Computer Aided Drafting	
	1 Analyze and interpret design data.	
	2 Draw 2D drawings and 3D models.	
	3 Use modern engineering techniques, tools and skills for engineering practice.	
8	Workshop Practice - IV	63367
	1 Understand importance of casting as a manufacturing processes	
	2 Design & Manufacturing of job with given parameters	
	3 Understand Basic working principle, Configuration, Specification and classification of machine tools.	
	4 Calculation of gear train ratios for given problems	